

## The gastric nematodes of *Varanus caudolineatus* (Reptilia: Varanidae) in Western Australia.

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### Abstract

Adult *Abbreviata levicauda* (Nematoda: Physalopteroidea) occurred in low numbers (1-10) in 4.3% of 139 *Varanus caudolineatus* examined. The caudal morphology of male nematodes conformed to that in specimens recovered from *V. tristis*. Both these lizards are predominantly arboreal.

### Introduction

*Varanus caudolineatus* is a small arboreal lizard confined to the desert areas of Western Australia, where it is an inhabitant of healthy mulga (*Acacia aneura*), and eucalypt hollows and rocky crevices (Pianka 1969). In studies on the diet of this lizard Pianka (1969) and King (unpublished) collected worms from the stomachs of 139 specimens, now preserved in the Western Australian Museum. This paper records the examination of these nematodes.

### Materials and Methods

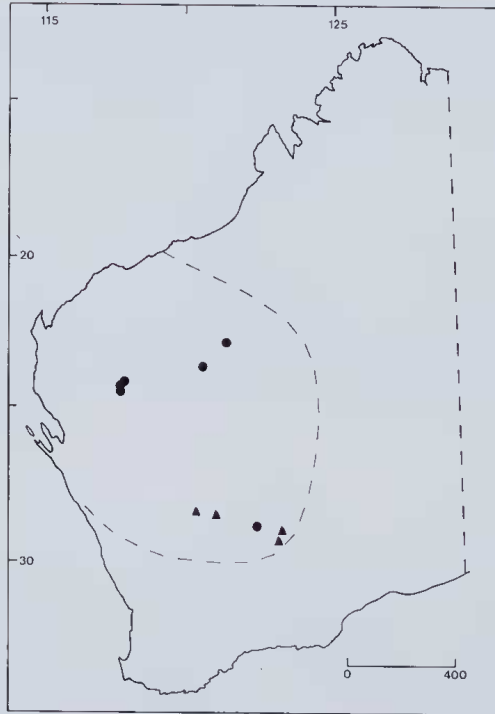
Specimens had been fixed in formalin and stored in 70% alcohol. They were cleaned, cleared in chlorolactophenol, and examined using an Olympus BA microscope. The drawing was made by means of a drawing tube. All specimens have been deposited in the Western Australian Museum.

### Specimens examined.

Four males, five females and three immature worms, WAM 25-91, ex. R87661, collected 13 k SW Mt. Phillip HS, 24°31'S, 116°14'E, 09.07.1984; one female, one immature, WAM 26-91, ex. R13362, collected Jigalong, 23°22'S, 120°47'E, June 1959; three males, six females, WAM 27-91, ex. R26320, collected Eastern Goldfields, 30°45'S, 121°30'E, no date; three males (incomplete), WAM 28-91, ex. R47793, collected 30 k. SE Bulloo Downs HS, 27.08.1974; four males, six females, WAM 29-91, ex. R87637, collected 12 k. SW Yinnietharra HS, 24°45'S, 116°96'E, 07.07.1984; two adult and two immature males, three females (incomplete), WAM 30-91, ex. R87770, same data as for R87637. The following four hosts contained immature worms only: five, WAM 31-91, ex. R70895, collected 3.5 k. N. of Yowie Rockhole, 30°26'S.

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**Figure 1** Distribution of *Abbreviata levicauda* infections in *Varanus caudolineatus*. ● adult worms; ▲ immature worms only. Interrupted line indicates limits of host's range. (Adapted from Storr *et al.*, 1983).

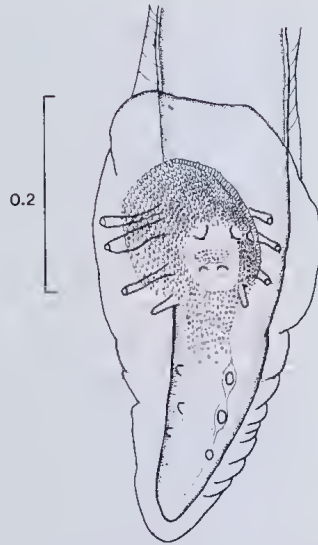
122°21'E, 09.08.1980; five, WAM 32-91, ex. R73223, 2 k. N. of Yowie Rockhole, 30°27'S, 122°21'E, 18.10.1979; one, WAM 33-91, ex. R73433, 9 k. 190° Mt. Elvire HS, 29°26'S, 119°35'E, 17.09.1980; three, WAM 34-91, ex. R84443, 14 k. S. Dromedary Hill, 29°11'S, 118°24'E, 01.10.1983.

## Results

Nematodes were recovered from the stomachs of ten lizards (figure 1). Adult *Abbreviata levicauda* Jones, 1983 were identified from six lizards (4.3%), in numbers ranging from one to ten (mean, 6.5). Four lizards contained immature nematodes only, and these have been assigned to the same species. No other nematode species were present.

No cysts containing larval worms had been observed in or on the stomach walls during dissection (King, personal communication), though they have been recorded in this lizard (Jones, unpublished).

Measurements and morphology were similar to those of *A. levicauda* described from *V. gouldii* (Jones 1983), except in respect of the two following characteristics: the copulatory spicules were shorter in specimens from *V. caudolineatus*, the right measuring 220-240  $\mu$ m and the left 380-480  $\mu$ m. Secondly, the morphology of the male tail differed; in all specimens examined in this study, the tubercles on the male tail extend



**Figure 2** *Abbreviata levicauda*. Ventral surface of male tail of specimen from *V. caudolineatus*. Measurement in mm.

a short distance posterior to the cloaca, and the ventral surface of the tail is smooth and free of tubercles posterior to the level of the anteriormost pair of ventrolateral caudal papillae. The three pairs of these sessile or short pedunculate postcloacal papillae on the lateral ventral surface of the tail are evenly-spaced (figure 2).

### Discussion

The configuration of the male tail in these specimens of *A. levicauda* from *V. caudolineatus* is identical to that described from specimens of this nematode from *V. tristis* (Jones 1986). I suggested in that paper that when this species of nematode occurs concurrently with closely similar related taxa, character displacement occurs. In *V. gouldii*, in which three species of *Abbreviata* may be present in high numbers in the same host, the male tail in *A. levicauda* has reduced tubercles posterior to the cloaca, and the penultimate pair of caudal papillae are situated close to the posteriormost pair, thus accentuating the difference from other species. The similarity in structure of *A. levicauda* from *V. caudolineatus* (in which no other nematode species were found) to those from sympatric *V. tristis*, in which there was a low prevalence and intensity of congeners, supports this suggestion.

Nematodes in the genus *Abbreviata* occur in the larger species of *Varanus* lizards throughout Australia, especially in the arid inland and the North. Specificity appears to be related principally to the ecology rather than to the phylogeny of these lizards (Jones 1988). It is noteworthy that both *V. caudolineatus* and *V. tristis* are largely arboreal, and although *V. caudolineatus* is a smaller lizard than *V. tristis*, there is likely to be considerable niche overlap.

Compared with larger tropical and desert varanids, which may support hundreds of *Abbreviata* at high prevalence, both intensity and prevalence of *A. levicauda* in *V. caudolineatus* were low. In Australia, species of *Abbreviata* are known to mature only in the larger species in each snake and lizard Family, the smaller species acting as paratenic hosts to the larvae which are often encysted in the stomach wall (Jones 1978 and unpublished). It is therefore interesting that *Abbreviata* occur as adults in the small *V. caudolineatus*, whereas they are unable to mature in the larger lizard-eating *V. eremius*, in the stomachs of which encysted larvae are found in large numbers (Jones unpublished). Many species of *Abbreviata* appear to have a low host specificity in reptiles, and the ability of *A. levicauda* to mature in one of these two closely-related small varanids and not in the other is perplexing; the explanation is probably to be sought in the evolutionary ecology of these lizards. Studies on other small Australian varanids would be rewarding.

### Acknowledgements

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